

In Their Own Voices

*A Conversation with
Howard W. Riley:
Early Agricultural Engineering
at Cornell University*



Interviewed by Gould Colman

on August 15, 20 and 28, 1963

The Internet-First University Press
Ithaca, NY
2007

PROFESSOR HOWARD W. RILEY

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An academic department was formed at Cornell University in 1907 through the leadership of Professor Riley; he was its Head for 38 years (1907-1945). The building that eventually housed that department was named in honor of him and Professor B.B. Robb. A centennial year history of that department, along with other related resources, such as his Memorial Statement and the first Ph.D. dissertation in his emerging field, are online at the above address.

PREFACE

"This manuscript is the result of a series of tape-recorded interviews with Professor Howard W. Riley.

"Professor Riley has read the transcript and has made only minor emendations. The reader should bear in mind, therefore, that he is reading a transcript of the spoken, rather than the written, word."

At eighty-four Professor Riley was physically erect and mentally vigorous when I talked with him in 1963 about the origins of agricultural engineering at Cornell. In this sequel to my book, *Education and Agriculture: A History of the New York State College of Agriculture*, I represent the Oral History Project, then sponsored by this college. Here a very articulate and largely unprompted Professor Riley records his accomplishments and mistakes, describes his limited access to educational resources that now seem primitive, and repeats his commitment to the overriding goal of teaching and research in the college at the time, helping New York's rural people improve life's quality in farm and home life.

June 2007

Gould Colman



Howard W. Riley, 1959

Howard Wait Riley

The following is the first interview with Professor Howard W. Riley, held in his home in Ithaca, New York on August 15, 1963. The interviewer is Dr. Gould P. Colman.

Colman: I think it might be good, Professor Riley, to get down something on where you grew up and the kind of home and educational experiences which you had.

Riley: I was born in East Orange, New Jersey on May 2, 1879. The nature of my early life experience influenced, I feel, the nature of my later life experiences. My mother was very energetic, and had a number of brothers. Two of those brothers made marriages that influenced my mother's life and mine. One married a cousin of Seth Low, who later became mayor of New York City and president of Columbia University. Another brother married a daughter of Lucretia Mott, a Quaker of Philadelphia who was an active opponent of slavery and a very active advocate of suffrage for women.

Mother was intimate with Mrs. Mott and with her daughter, Martha. Before my one brother and I were coming along, Mother's need for mental activity led her to found the Women's Club of Orange, New Jersey, in 1872. Then many years later after we moved to Ithaca in 1894, my mother in 1895 founded the Women's Club of Ithaca for the specific purpose of promoting suffrage for women, which, by the way, the women of Ithaca were not ready to accept at that time as a major objective.

When I was three years old, my parents bought sixty acres of woodland on a small mountain in New Jersey within about two miles of Murray Hill, which is the site of the present great laboratories of the Bell Telephone Company. We lived on this property for eleven years, and there I grew up with an intense enjoyment of life close to nature, but the economic character of my experience was such that I had no training whatsoever in meeting economic difficulties. Our income was modest, but it came easily from an inherited property, and it kept our family in physical comfort all through my youth and on into my married life. I have felt that this freedom from economic stress in my youth had a very marked effect on my reaction to opportunities later in life.

The other point I want to stress is that the mental atmosphere of the home was one of continuous mental activity and always of an altruistic nature. Years later, my father went to Indianapolis to take part in an attempt to start a third political party, which, as we all know, did not succeed. He had been obliged, through poverty, to leave school at thirteen, and he had worked hard in New York business life until, when I was about five years old, he retired completely from business life. While he had dropped out of school, he had educated himself, and

his interest had centered on economics, so that later in his life he granted himself the pleasure of buying a very fine steel engraving portrait of John Stuart Mill.

Two years ago I had the pleasure of presenting this portrait of Mill to the Department of Economics of the university here, and they accepted it with pleasure and with the statement that they had long needed to start a gallery of portraits of economists, and this would serve admirably to start the development of that gallery.

Colman: I'd be interested in a little more information about this farm.

Riley: The farm that we lived on in New Jersey was mostly wooded, and we heated the house mainly with open fires of these small oak trees. There was a little patch of hay land, and we had a very large garden from which we got a generous supply. The well was some 150 feet away from the house, and water was provided in the kitchen with an ordinary pitcher pump. This experience was a stimulus to me in my work with the farmers of New York State.

The sanitary provision was an ordinary outside privy, an experience which also influenced my later work.

We had one horse and kept two cows and some chickens, I ran a small flock of chickens as a financial enterprise, and when we had no hired man, I got 50¢ a week for milking the two cows and taking care of the one horse.

Our equipment was a four-foot mowing machine and a hay rake of the turnover variety, more primitive in its design than the dump rake. I operated that turnover rake, and since that time I have owned and operated the very common dump rake, a McCormick drop reaper, a McCormick self-binder with Appleby knotter, and a horse-drawn combine. Also I owned one of the earliest single-cylinder gasoline tractors sold by the International Harvester Company and later owned a more modern tractor, so that I have been interested to think that my actual experience with farm implements has extended in my one lifetime from the very primitive to the forerunners of the modern, extremely complicated machinery that is revolutionizing the agriculture of the world.

Incidentally, the first money I ever earned away from home was with 50¢ that I was paid for cutting with the cradle, a small field of oats for a neighbor.

Colman: Was the cradle used very much in your boyhood in that area?

Riley: As to the nature of that area, as I think of my youth experience and the youth experience of Professor B.B. Robb who contributed so much to our departmental activities, the area in which I lived was on top of a hill. Our property was largely woods. We cut a little hay, and had a very large, well-tended garden. But we had no economic pressure in our activities. Also, the neighborhood was not one of full-sized, high-pressure farms such as Professor Robb came from. Our neighbors were market gardeners who trucked their produce ten or fifteen miles away to the markets of Newark. So my home influence and my neighborhood influence was one of lack of economic pressure.

Colman: You once told me where you got your hired men from. I think it would be interesting to get that on record.

Riley: The period from 1885 to 1895 was one in which immigration into this country was very active, and because our family income was moderate, my

father would go to Ellis Island and there secure the services of newly arrived immigrants. I remember in particular a French couple who came to work for us, and because I constantly whistled about the home, they immediately dubbed me as "le petite siffleuru," that is, the little whistler. These people worked for us for very moderate sums and were very interesting people.

We also employed the children of the neighborhood, one of whom stayed with us as cook for the entire remaining life of my father and mother both. Again, this whole experience was of a nature far different from the farm life experienced by Professor Robb on his home farm in Webster, New York, and that constituted an important reason why the coming of Professor Robb into our department was a very great factor in achieving its efficiency.

My schooling was achieved by walking two and a half miles to a village grammar school, and later walking three and a half miles to a railroad station to take the train to a high school. Then in 1894, we came to Ithaca and, as I went with my father to register with (Frank D.) Boynton who had just come to Ithaca, I well remember my father's saying, "This boy wishes to prepare to study agriculture, but I think he had better take electrical engineering."

So I spent three years in Ithaca High School and then registered in the Department of Electrical Engineering at Cornell, which I believe was then the first department of electrical engineering anywhere in the country. I graduated in 1901 and then entered commercial engineering with the United Telpherage Company or "far-carrying" company in New York City. I spent three years with them, and then was employed by (Frank) Morse of the Morse Chain Company of Trumansburg, New York.

Colman: Did your family move to Ithaca in order for you to prepare for Cornell University?

Riley: Yes, Father selected Cornell University because of its forward look educationally. When we arrived in town in 1894, the university was twenty-six years old, so now I've known the university for about seventy-five years.

Colman: Do you remember Professor Harris J. Ryan in electrical engineering?

Riley: Professor Ryan was head of the department. I knew him intimately, and my father-in-law and mother-in-law and wife were intimate with Professor and Mrs. Ryan. I visited Professor Ryan in 1926 out in Palo Alto.

Colman: Could you describe him at some length and what kind of a teacher he was?

Riley: He was a very delightful person, very kindly, very conscientious. I remember when I visited him in 1926, I asked him a technical question and he started to reply to it. His wife interrupted to say that he really ought not to exert himself so much to tell me what I needed to know, but he said, "But my dear, this young man has come here seeking technical information that I can give him, and I've got to give it to him." And he did. He got me to take, as an engineering senior problem, the conversion of a direct current dynamo into an alternating current dynamo which is an indication of the fact that at that period of time, the electrical industry was just waking up to the necessity of the use

of alternating current instead of direct current. My problem was to provide a machine that could serve as a laboratory device for students to study alternating current instead of direct.

One can ramble on at length about the various things that have happened during the years. So much has happened that it's impossible to touch all.

Colman: Is there anyone else who particularly impressed you while you were a student at Cornell?

Riley: I lived at home down on University Avenue and mingled mostly with members of the Sibley faculty: Professor (John Henry) Barr, Professor (William M.) Barnard, Professor (Johnny) Morris, who was in charge of the shop, and my interest was pretty much in the shop.

I got a Sibley prize for shop work, I remember, because I liked it. But I did not mingle with the academic life of the university very much.

Colman: Was the entire Morse operation in Trumansburg at that time?

Riley: Yes, it was, I left the company when they moved to Ithaca. In fact, I was functioning as a sort of right-hand man for Frank Morse at the time that the South Hill establishment of the Morse Chain Company was being planned. I wrote many orders for the new buildings up there and worked on the layout.

But my desire for agriculture was still so intense that I decided that I would not continue in commercial engineering. So that's what led me to turn finally to agriculture after I'd been teaching in Sibley for a while.

Colman: How did you get from Morse Chain Works to teaching in Sibley?

Riley: The process was that I just plain quit the Morse Chain Company and got married. I was living temporarily on the Heights right next door to (Louis) Fuertes on Thurston Avenue in a building that has since been replaced by a larger building. I was one day walking on the campus, waiting for the College of Agriculture to open so that I could begin studying agriculture, and Dean (Dexter) Kimball came along and asked me if I wouldn't consider taking an instructorship in Sibley College at the munificent salary of \$750. Well, I had begun to worry somewhat over my capacity to finance an agricultural activity and so I took the job in Sibley, but by the first of January I was pretty well fed up with that and so I went to Dean Bailey to apply for an opportunity to teach farm mechanics in the College of Agriculture.

Now I should point out that that time was when Bailey was very active in promoting the betterment of country living in New York State. I think he was chairman of the Country Life Commission, and he had Theodore Roosevelt up here to look over the abandoned farms of Tompkins County. It was because of that activity and my own interest in agriculture that I applied to Bailey for this job. He inquired about my agricultural experience and very properly turned me down as being not fitted for the job. But apparently he had failed in his attempts to get anybody else, and so in August he gave me the job. Thus began forty years of service.

Colman: Where were you located at first?

Riley: The then new buildings, Roberts Hall, what is now Stone Hall, and

the dairy building were completed, and where the home economics building is now was a large heavily-framed barn that had served the farm activities of the area. When the buildings were designed around 1904-05-06, provision had been made for farm machinery in the basement of what is now Stone Hall, and the question of teaching machinery had been in the hands of agronomists, particularly one named (Samuel) Fraser. He was a very energetic man, and had done a little teaching on how to handle machines and plows.

When President White had gone to Europe to get equipment for the new university, he had found in Germany a very large, historical assortment of models of plows which were known as the Rau plow models. He had contracted to have a duplicate set made, which had come to this country and had been deposited in the College of Agriculture. The models were numbered and there was a complete set of cards to identify them. But I suppose in the confusion and in the pressure to do some extension work, the cards identifying these models were lost and the models were used by Professor (John L.) Stone of the agronomy department in serving as objects of interest in exhibits at fairs, with the result that much important information was lost, Professor (G. N.) Law of the College was interested in these models because of their historical significance, and we tried to set them up properly but didn't succeed very well. At the present time, they are well displayed in the basement of Riley-Robb Hall but the detailed information as to the history of each one is still lacking.

In the basement of what is now Stone Hall, when I arrived to begin work I found a display of equipment manufactured by the J. I. Case Company and supplied by the agency from Syracuse. Among other things there was a full-sized Case threshing machine and a Case steam tractor for operating it. Also there were some Oliver plows, some cultivators, and also a Case disc plow which was not at all appropriate for New York agriculture.

For office equipment, Professor Bailey had found somewhere an ink-stained desk and a hard-bottomed kitchen chair. These constituted the stock of the Ag. Engineering office. There was no typewriter, and Professor Bailey provided a hand-operated letterpress so that I wrote the department letters in long hand and copied them with wet rags under this letterpress. Also Mr. Fraser had purchased a Keuffel and Esser traction dynamometer. This equipment is shown in the photograph of the stock of the department which is on display now in the vestibule of Riley-Robb Hall.

Colman: How many people did you have helping you?

Riley: I had no helpers. I just started in there. I had been instructing in the mechanical laboratory of Sibley, and so when I came over the natural thing to do was to begin a little similar activity in agriculture. Having a full-fledged steam engine, I arranged to draw steam from the university heating system and pipe it into the engine on this tractor. I began to teach the boys the operation of slide valve and how an engine was lubricated. That brings up a little incident involving the lubrication of steam pumps incidental to explaining this tractor and the steam pump with which it was equipped. It had been necessary to explain the simple little lubricating device that went with the pump, in itself very simple, but vital to the operation of the pump. Without the lubrication,

the pump would stop.

That winter, at one of Professor Bailey's assemblies that were so stimulating for the college staff, I was in the Roberts assembly hall one very cold winter night, and there came a man from the boiler room below to say that the ignorant attendant had incorrectly adjusted the lubricator for the pumps that were vital to the operation of the heating system of the new agricultural building that the pumps had stopped. He had run the supply so fast that the oil was all gone, and unless something was done the heating would stop and the entire building would freeze up, I got quite a thrill out of applying my rather newly-acquired intimacy with this small lubricator to go down to the boiler pumps and renew the supply of lubricant, correct the rate of adjustment and ensure that the equipment did not freeze up.

By the way, those assemblies at which Professor Bailey read, often, his own compositions were tremendously stimulating occasions.

Well, to get back to our beginning to teach, my life experience had shown me the necessity of providing for the water supply of farm homes, and so I immediately began to teach the operation of pumps. Always through my entire teaching experience, my desire has been to ensure that the students would learn how to think, starting with the simple, physical, fundamentals and then carrying them on to application to their life experiences.

To jump ahead a little bit, this desire to help the farmers of New York State improve their living conditions led [me] to stress the simple physics of pumps and water systems, and also I very soon realized the importance of teaching the farmers how to provide sewage disposal systems. My interest was very much with the people themselves, so that what moderate amount of writing I did was included in the reading course lessons rather than in bulletins. The bulletins came later from the help of other men in the department.

But the problem of the disposal of sewage necessitated the installation of septic tanks, and septic tanks could be built only with a form. So I busied myself later on in devising a kind of form that could be repeatedly used to build many concrete septic tanks. I realized that to build this form took money, labor, and detailed knowledge, so I worked especially to develop an essential detail of the construction of the corner of the form of a rectangular form. This was such that the form could be used and then withdrawn uninjured from the completed tank, and then this once-used form could be loaned to somebody else to enable him to build another septic tank from this same uninjured.

Then with the reading course lesson on how to dispose of the effluent from the tank, a man could install his own sewage disposal system. A very considerable number of these forms were built and administered by the county agents, so that they served to assist farmers to install bathrooms in their homes at a period previous to the time when there came on the market commercial septic tanks that could be used without requiring the farmer to build his own. That was a very definite contribution, I feel, to the improvement of conditions in the state.

At this point I might touch on another activity I took part in to assist the farmers of the state in that was providing homemade tanks for refrigerating their milk with ice before commercially insulated tanks and mechanical refrigeration

were available. The sanitary requirements for milk were becoming more strict, and insulated tanks were necessary. The farmers could build them only with concrete. To insulate them, some farmers, uninstructed, used un-waterproofed, fibrous insulating material and incorporated it in the walls of their cooling tanks. Almost immediately this material became water-soaked and became completely ineffective as an insulator, thus wasting the ice.

So it was obvious that cork should be used, but cork also would be badly affected by water, so I undertook, at first, to show the farmers how to coat cork with asphalt in order to waterproof it. But this was obviously a difficult thing for them to do, so I undertook to get the Armstrong Cork Company to provide fully waterproofed packages of cork of appropriate sizes to be used in making milk cooling tanks. To do this, we had to arrive at sizes of tanks and sizes of packages of cork that could be incorporated in the walls of these different sized tanks. I was successful in getting the Armstrong Cork Company to cooperate in this activity and quite a good many of these factory waterproofed packages of sheet cork were marketed and used by the farmers.

The following is the second interview with Professor Riley, held on August 20, 1963. The interviewer is Dr. Gould P. Colman.

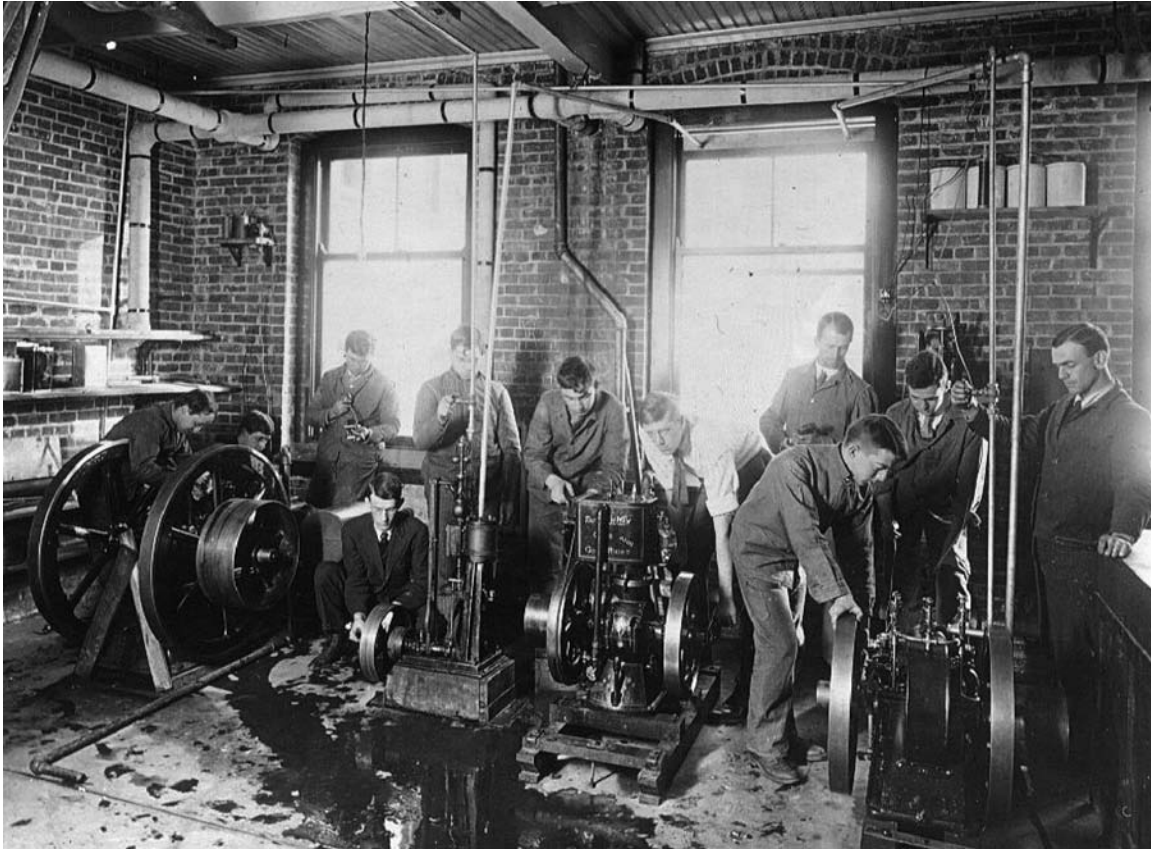
Colman: I see that so far, with the exception of your work with steam engines, we don't have anything down about your early teaching. I think it might be good to get something of that on record.

Riley: We'll come to that, but I'd like to get some of these other thoughts off my mind.

Colman: All right, you can go right ahead then.

Riley: As we said sometime ago, the beginning of the work in farm mechanics was developed from absolutely nothing. As I had come directly from teaching in a mechanical laboratory in Sibley, I naturally carried over a good deal of that sort of thought into agriculture. The gasoline engine was just coming into prominence, and Dean Bailey arranged with his brother-in-law, Mr. Vandervort of Root and Vandervort, to give us, a single cylinder gasoline engine which we promptly installed in front of one of the north windows in the basement of what is now Stone Hall. The exhaust pipe went out to the north at the top of the window and had on its other end a cast iron muffler.

I borrowed from Sibley College an old gas engine indicator and introduced as one of the exercises a study of the effect on the indicator card of variations in the fuel mixture. This, of course, resulted in many failures of explosion, and that resulted in the accumulation of unexploded mixtures in the muffler. Well, one day it happened that conditions were just right so that the flame of the last discharge exploded the unexploded material in the muffler, which blew up the muffler. This happened in the presence of a young lady going along the walk below it. Fortunately she was not struck by any of the flying particles of cast iron. This resulted in the engine's not having any muffler, and as I have thought of it since, I have very much regretted that I did not immediately purchase a wrought iron muffler and put it on that pipe, but instead we ran the engine



Power laboratory in the basement of Stone Hall. Vibration during operation caused serious interference with the use of microscopes in the botany facilities on the top floor. (from A Pioneering Department, p.14. by Ronald B. Furry)



Byron B. Robb, first faculty member hired by Riley (in 1911). (A 1959 photograph)

without any muffler for months, and the exercises in farm mechanics disturbed the peace of the ag. campus with the loud explosions of that gasoline engine. I have always regretted that some faculty member didn't put the pressure on me to get that thing corrected.

One other thing that the operation of that gas engine did was to jar the entire building, and (H. H.) Whetzel and other faculty men and students were upstairs, with the result that the running of the engine prevented their keeping their microscopes in focus. That was one of the contributing causes that made all anxious to get us out of Stone Hall. (See opposite page.)

Thinking about those times leads me to remember this incident. One of our exercises was the operation of a hydraulic ram, and that, of course, resulted in cold water being discharged into the drainage system of the building. One day, the drain stopped up and (Carl) Dickens, the plumber, was called in to correct it. Anyone who knows Carl knows that his conversation is very dynamic and vigorous, and so when he found that there was a good deal to be done to correct this difficulty, he anathematized [cursed] the Department of Farm Mechanics with great energy. However, we were relieved of blame when it was discovered that the stoppage in our water system had been occasioned by one of the scientists upstairs pouring four quarts of melted paraffin into the drain, which, when it came down and struck our cold water immediately solidified and stopped everything.

It is appropriate at this time to speak of the arrival of (Byron B.) Robb into the activity of the department. (See opposite page.) As I remember the talks which I had with Mr. Robb at that time, his history was this: he was the son of a farmer living in Webster, New York, and he had worked with his father in their farming operations, the most lucrative of which, I believe, was the growing of strawberries and the marketing of that product in Rochester. Also, Robb worked in the drying houses where apples were dried. In addition, he was very popular as umpire in the ballgames of the boys of the region. As I remember, his statement was this: that one day, it came over him like a flood that if he were going to amount to anything, he would have to improve his education and stop the routine work that occupied his life at that time. It was then that he decided to go to Cornell, and when he got there he found that the farm mechanics activity appealed to him. So he became the first student to specialize in farm mechanics. Later on, he took work in Sibley College and finally he, in his later years, went to Harvard and did most of the work necessary to securing a PhD. degree, but he did not find it practical to complete all the details so he did not get the degree. He had the type of mind well adapted to philosophical reasoning.

Now I would like to interject at this point the statement that I began work in teaching farm mechanics in 1907, and it was in that fall that Professor Ocock of Wisconsin and (J. B.) Davidson of Iowa were organizing the American Society of Agricultural Engineers. The initial meeting was at Madison, Wisconsin in the fall of 1907. I was invited to attend that meeting, and was also invited to deliver the first paper ever delivered to the American Society of Agricultural Engineers.

We were all interested in looking into the crystal ball of what the future held

for agricultural engineering, and this paper of mine was naturally on that topic. I have been interested to look it over in later years and to find that I foresaw the development of the general distribution of electrical energy into the country, but I have regretted that I did not foresee the tremendous influence of the versatility of the gasoline engine upon the changes of agricultural processes. My foreseeing of the development of the distribution of electricity into the country indicated that my major interest was in the sociological influence which engineering developments could have upon the domestic lives of the people who lived in the country. That was my major interest. It was what urged me to go to Bailey, and Bailey's influence on country living was the stimulating influence of the time.

Later on, I was elected as fifth president of the American Society of Agricultural Engineers, and my principal activity that year was to appoint an Iowa professor, (Matt) King, as chairman of a committee to revise the constitution of the American Society of Agricultural Engineers so that its corporate functioning could be carried on by mail instead of the procedure which the original constitution provided, which was that no corporate activity could be carried on except at the annual meeting. This change has received very little emphasis in the thoughts of the members of the society, but I have always felt that it was a vitally necessary step at that time in order to permit the society to grow into the great organization that it is now.

One or two years later, I was invited by Davidson to be one of the test engineers at the last Winnipeg Motor Contest in which the very large traction engines of the time were officially tested. My wife and I went to Winnipeg via the boat trip through the Great Lakes and enjoyed it immensely. She always looked back upon it as one of the major experiences of her life.

While we are discussing that sort of activity, it comes to my mind that a number of years later, the American Society of Agricultural Engineers was asked to appoint a representative to cooperate with the American Society for Testing Materials on a committee that was attempting to initiate tests of galvanized wire fences. I was appointed to be that representative, and attended a number of meetings in New York City. I very soon found that the meetings would work on the problem of arranging to get samples of galvanized wire and expose them for atmospheric tests, and then always at the end of the meeting, somebody representing the commercial firms would make some motion that would throw a wrench into the gears and all hope of starting a test at that time would be lost.

I don't remember how many such meetings I attended, but finally it became clear to me that the trouble with these commercial representatives was that it was obvious that the materials supplied by the commercial companies must include some galvanized wire with a very thin coating of zinc, and that such badly galvanized wire would not be a credit to whatever company it was that supplied it. The commercial representatives evidently felt that though the technical men would know that this was no evidence of improper activity on the part of that particular company, still they felt that the publicity that would result from the early failure of such thinly coated wire would not be a credit to whatever company had agreed to supply it.

So after attending several such meetings, I came forward with the

proposition that all the material should be provided anonymously and that the differentiation of the samples should be by the use of micro-photographs of the sectioned coatings. In this way, the technical facts involved with the various samples submitted were completely determined by the microphotographs and the very thin samples and the very thick samples could all be made, and nobody's commercial name would be connected with it. I later received a letter from the American Society of Testing Materials acknowledging that that suggestion had put the testing enterprise on its way, and they were grateful for the recommendation that I had made. These materials, incidentally, were sent to us as one of the cooperating institutions, and they were mounted in a fenced-in area on the Snyder Hill Road.

In connection with that, I want to recall this point: I worked with Bill Barrett to set up the posts on which the wire samples were stretched. I knew that fence posts tend to be pushed out of the ground by frost action, so I specified that these metal posts must be put in concrete in the post holes, and that those holes must be dug so that they were smaller in diameter at the ground level than they were lower down; that is, that the concrete would be conical in shape with the small diameter at the top and the larger diameter at the bottom. In that way, frost action could not heave the concrete footing. I think that these posts have been in the ground some twenty-five years, and I'm quite sure that none of them has heaved.

Colman: What did Mr. Barrett think of the idea of digging the post holes that way?

Riley: Well, Joe Kimball, who dug the post holes objected strenuously, but that provision achieved its purpose. Professor (B. A.) Jennings was for years the man who made the annual inspection of these galvanized iron samples for the American Society of Testing Materials. Who does it now, I don't know. I believe that practically all the thinly coated samples have been destroyed by atmospheric action, but that the very heavily coated ones are still, after all these years, bright and strong.

Thinking of our early activities when I began teaching, it happened that as a schoolboy in Ithaca, I had built a sailboat and sailed on Cayuga Lake. Anyone who sails becomes interested in knots, and when I began teaching mechanics to agricultural students, it became evident that one thing they needed to know was how to splice a rope, because the haying process involved the use of hay rope. So, as one of the teaching exercises was the question of splicing hay rope, it led to my interest in teaching them how to tie a bowline knot and how to make a rope halter. From this interest, I was led to develop a technique for teaching them how to tie a rather wide variety of knots. This developed into an interesting activity.

I became much interested in using the consuming interest of the students in this matter of tying knots in order to make it a means by which I could force them to read, I could lead them to read verbal instructions, gather from those instructions the import that the words were to convey to them, and then they would prove whether they had gathered the correct import of those instructions by whether they could put them into practice and get the correctly completed

knot. In order to make the instructions correct, I used my wife as the indicator of the correctness of the words. What I did was to write out the instructions for each knot, give her a piece of rope, and if she could not tie the knot, I then changed the instructions until she could get the desired result. I mimeographed these instructions and gave them to the students. I remember one man in particular. I think his name was Wall. He later became an instructor at the ag. school at Delhi in Delaware County, and he, for a long time, used those mimeographed words as a means of teaching his students.

I later made a pedagogical mistake in that I became interested in making pictures of how to tie these knots, thereby by-passing these verbal instructions. My wife and I made pictures of the various stages of tying the knots. She took the pictures and I held the ropes. I used one-inch rope, so that we got very large, explicit pictures. Then we printed the negatives onto blueprint paper, and I got Professor (J. E.) Reyna of our department to delicately outline the rope pictures in ink. Then we chemically faded out the blue of the pictures, and that gave us very lovely black and white ink sketches of these knots. From this, I printed a reading course lesson on knot tying and splicing ropes and making rope halters, eye splices, etc. This publication came to the attention of the Boy Scouts activity, and they wrote to me, asking me to prepare material for their Boy Scout handbook.

I now regret very much that I did not accede to that request, but somebody else, upon my refusal, used our material to provide the illustrations in the Boy Scout handbook. Now as I think still further on this, I regret still more that I did not furnish to the Boy Scouts for printing in their handbook those carefully prepared and tested verbal instructions, because I have always felt that this activity afforded a fine opportunity for the training of the students in reading verbal instructions and putting them into execution. It required them to grasp the idea that was being incorporated in the words and to put it into operation. I have felt that it might possibly have been effective if that had been done in the Boy Scout handbook, along with the pictures, that it would have developed some scout leaders who would have held the boys to the use of the verbal instructions in order to get the training that they gave. As a practical fact, however, I believe that the earnest desire of the Scouts to get their various badges would have resulted in the fact that they would have automatically followed the pictures and not subjected themselves to the mental processes of interpreting words in order to get results. I've always felt that this involved a very definite phase of pedagogy that should have been made more use of.

This is just a little personal experience. While I was in the process of developing the knot bulletin, Bailey Hall was being erected and the time finally came when the great steel girder that was to span the proscenium arch of Bailey Hall was to be hoisted into place. I was out there watching the proceedings. In order to connect the hoisting mechanism with the girder, the man in charge needed to make a loop in a hauser about three inches in diameter. He had several immense coils of this very heavy rope to be used in this process, and while I watched him, he seized this rope at a point mid-way between two coils and proceeded to twist and pull and adjust right in the middle of the length of this great rope. He came out with a loop in the side of the rope without having

had access to either end. They hitched to it at that point and pulled the girder up into position, and then were able to untie the rope at that point. I realized that from the knot-tying point of view, that was quite an achievement, so I got the man to explain it to me fully and after studying its construction and adjusting it a little bit, I discovered that he had tied a bowline knot in the side of the rope without having had access to either end. I incorporated that in the lesson, but the world has not had much interest in it, and it has not been repeated in later publications. That was an interesting thing to me.

These knot pictures have been added to by some later editors, and many of the original cuts have been dropped out. I may say that while I was gathering the information for the bulletin, I consulted with Professor Stone of agronomy on how to tie a bowline knot about the neck of a horse. I also consulted with Professor (John H.) Comstock of entomology who, in his boyhood days, had earned money by being a sailor on vessels on the Great Lakes. Professor Stone also showed me how to make a rope halter.

As is easy to imagine, since the presence of farm mechanics instruction in the basement of Stone Hall resulted in these loud explosions of the unmuffled gas engine, sending sharp, pistol-like reports out into the quadrangle of the Ag. College, and since the physical vibration kept the microscopes from remaining in focus, it wasn't long before there was a great desire to move our instruction from the basement of Stone Hall. It happened that the site had to be cleared for the erection of the Entomology Department Hall, Comstock Hall. On that site was a heavily-framed barn which had served for the farming operations of that area, and that barn was taken down, Professor Bailey arranged for us to use such material as we needed out of that barn structure, with the result that we supervised the construction of a one-story building on the hill at the east end of the Ag. College quadrangle that is now occupied by Mann Library. Then later on, we built another building to the east of that first building on the original site, with the help of staff members. There was a little building in between which served as a shop for our mechanic. Now to complete the history of those buildings, they were later moved by the university out to Judd Falls Road where we occupied them for some years. Now that Riley-Robb Hall has been erected, those buildings are occupied by the Ag. College mechanics. (See next page.)

Colman: As I recall, a new building for agricultural engineering was in the state plans back in 1919 or so. Do you remember anything of your hopes for securing this new building over the years?

Riley: Yes, there were constant suggestions that we would have a new building, but at the same time it was becoming more and more evident that a vital need for the college was a new library, and so our hopes for appropriations kept being side-stepped while pressure was being developed and hope established for the construction of a new library. My recollection of the exact inter-relation of dates is not good. I do remember, just to get in the history, that after our first building was erected on the hill at the east end of the quadrangle, our offices were moved from Stone Hall over into a poultry building that had been occupied by the Poultry Department. That was up in the trees to the northwest of that building of ours. I think it was about where Warren Hall is now. Then later on we had offices in Caldwell Hall, at the time when Professor (E. O.) Fippin was



The previous agricultural engineering temporary buildings, essentially single story sheds constructed of wood, appear in the center right. The Alumni Field occupies the foreground. Tower Road and Stocking Hall appear in the center left.



The new home of Riley's department was dedicated officially with the installation of the cornerstone in 1954. Relocation of the department to this newly constructed structure occurred in February 1956, after being housed in Stocking Hall.

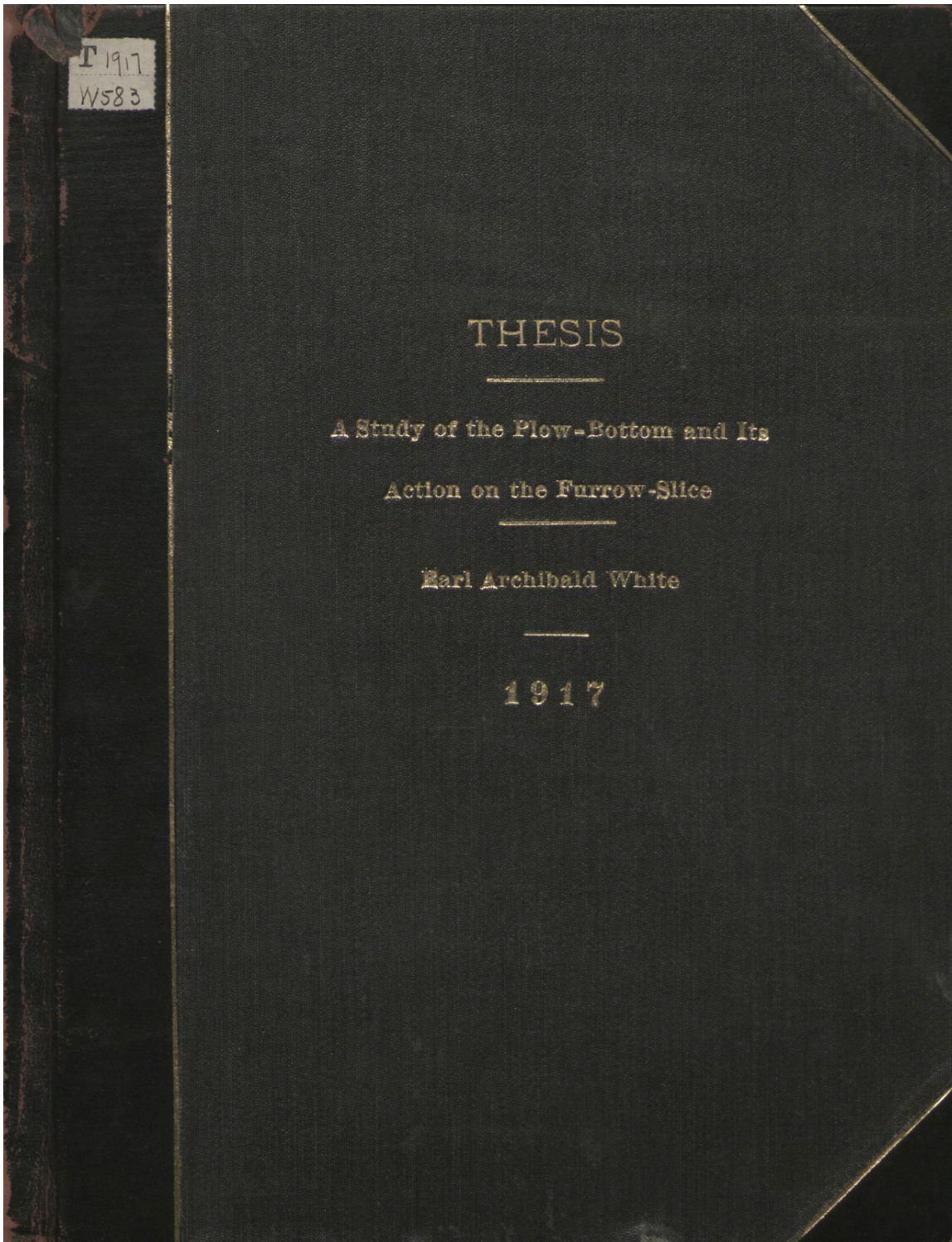
active in drainage. In fact, there developed at that time a more or less friendly rivalry between Professor Fippin and Professor Robb as to which man was really the ultimate authority on how drains ought to be installed in New York State. During the war, Professor Robb did very constructive work in organizing and administering a very considerable number of Buckeye traction ditches that were used throughout the state to put in drains. He and Jennings and (Norman) Steve did a great deal of surveying around the state to lay out these drainage systems that were put in by the ditching machines run by the state.

To continue this recording of thoughts on the development of agricultural engineering, on the basis of time there were two activities that occurred when we moved out of Stone Hall and were in the building at the east end of the quadrangle. One of these activities was a request from a farmer who lived, I think, in Trumansburg. He asked that we assist him in freeing him from his contract with a tractor manufacturer and thus keep him from being obliged to pay for a gasoline tractor that he had contracted for with them. The explanation of this is that the machine was large and clumsy and had not yet been adapted to the needs of eastern agriculture. So this man came to us to help him out of his predicament. The basis on which he was objecting was his claim that the engine was thermally inefficient. He asked us to test the engine and prove that it wasted fuel.

In order to do this, we set up a wooden framework west of our building on that hill. On this we mounted a heavy shaft which, in turn, carried a cast iron wheel which I borrowed from Sibley College. This wheel, this large pulley was of a special design which made possible the process of cooling the wheel with water on the inside of its rim. The heat would be produced by the friction of a Prony brake applied on the outside of the wheel. The test was to set up the tractor, carry a belt from its pulley to another pulley on this newly established shaft, and then have the tractor drive the shaft, spin this special wheel with water in its rim, and then we would tighten the bands of the Prony brake to apply friction on the outside of the water-cooled wheel. Then by measuring the pressure produced by this friction on an arm resting on a pair of scales, we were able to run what is called in engineering a Prony brake test on the tractor, measuring its effect through the Prony brake. We did this and found that the engine was reasonably efficient, and so we could not give the farmer any condemnatory data to present to free him from his contract. However, he made fuss enough over the whole situation so that he was released from his contract.

Now that brings to thought an incident in those early days of tractors. In 1913, I had begun farming on a property on West Hill, and I had purchased one of International Harvester's early models of tractors, a single cylinder engine that transmitted its power through a very simple transmission system that was put into operation by the pulling of very simple levers in front of the operator.

I was living on the farm and would go to the office every day. When I came back at night, I would find out what had happened. One summer we had a student helper, and when I came home at night, I found that that boy, in operating that tractor, was going about its routine operation in the field when the mechanism that ensured the connection between the front wheels of the tractor and the frame of the tractor had become loose. This permitted the front wheels to drop



The first Ph.D. thesis in the field was written by Earl A. White and was done under the supervision of Professor Howard W. Riley at Cornell University.

out of that point of attachment. It was the weight of those front wheels that had kept the tractor from turning over backwards, and so when I got home at night, I found that this boy, as he was going about the field, had seen the front of the tractor rear up. Fortunately he was quick-witted and fortunately, also, the primitive lever system for connecting the power of the engine to the tractor made it possible for him to simply throw out his hand in front of him, strike the levers, disconnect the engine, and the front of the tractor came down into the earth. If that boy had not done that, he would have been killed. I was thinking last night that it might have been that I would have been held financially responsible to the tune of tens of thousands of dollars. But the boy wasn't killed.

That was part of our teaching through the state, to warn farmers against the danger of their tractors rearing up and turning over backwards upon them and destroying them. The newly developed Fordson tractor was small but very powerful, and if a farmer was injudicious in calling upon the Fordson tractor engine to exert all of its power under certain conditions, that power would cause the tractor to turn over backwards and kill the farmer. It is still one of the dangers of power farming.

This thinking about what happened at certain times in the history of the department leads me to remember that a professor from one of the western colleges, I think it was Illinois, (E. A.) White, came to us and applied for an opportunity to acquire a PhD degree in agricultural engineering. The project that was in his mind was to study the construction of the plow bottoms in their relation to the turning of the soil. (See opposite page.) To make a long story short, he worked his three years on that project, and the university committee of which I was chairman granted him a PhD degree. This, I believe, was the first PhD ever granted to a man in agricultural engineering. As a matter of fact, I have always felt that the White investigations were completely futile. As it boils down, what he did was to mechanically determine a succession of curves of the surfaces of a number of plow bottoms. This information he took to the Department of Mathematics in the endowed university, and he then proceeded to establish an equation for these surfaces, for these curves, on the basis of a certain pre-determined pair of axes.

The activity was out of my realm, and was carried on wholly with the Department of Mathematics. As the finale approached, I told them that White should not get his degree under engineering, but should get it under mathematics. To this they objected, because they said that many departments other than mathematics came to them for technical assistance, and if they began to establish a practice that when a man wanted special mathematical help the different departments could not supply, if, when students from other departments went to mathematics for such help, then if mathematics took the student over as their graduate student, they would set up a situation of jealous fear, that other departments would not come to them for help which they currently were being able to supply. So, as I say, White's thesis on plow bottoms was really an example of mathematical gymnastics which had no relation to agriculture, because all he did was to establish mathematical expressions for the curvatures that happened to be the surfaces of plow bottoms. But the results that he obtained had no relation whatsoever to the effect of the mechanical process of turning

over the soil. However, it was the first PhD that anybody ever got in agricultural engineering. White has now passed on, and so far as I know, his work did not contribute significantly to studies in tillage.

We have had other graduate students, one of whom was [A.L.] Teodoro, a Filipino who came here to get a PhD degree in the use of alcohol as a fuel for internal combustion engines. He got his degree, went back to the Philippines, and took a prominent part in developing the use of alcohol as a fuel source from the sugar locally produced in the Philippines. Teodoro is now, I believe, dean of an educational institution in the Philippines, Exactly what college it is, I don't know. But he is a brilliant man.

Another graduate student who is of current interest here is Mr. (N. P.) Tolani who came from India some fifteen years ago during my last year on the faculty. Mr. Tolani came from India to get a general education in drainage engineering. I think he got a Master's degree and went back to India. Just a few months ago, Mr. Tolani came to see me and I discovered that he, during these fifteen years, had been doing major engineering work in India, building multi-story apartment houses and very large earth dams for impounding water for irrigation purposes. He has become financially very well to do. His younger brother graduated a few years ago from civil engineering and is now in India conducting the work that his older brother began. The older brother is now here in Cornell working for a PhD in economics, but he got his engineering start by taking routine courses with (A. M.) Goodman and Robb in drainage. This has stood him in excellent stead in his professional activities during the past fifteen years.

One other item of general history that I would like to note is this: during the period of Dean Bailey's administration when ag. engineering work was beginning, there was an activity known as the plant industry seminar at which various departments contributed programs pertinent to general plant industry. There came a time when it was up to farm mechanics to offer one of the monthly plant industry seminar programs. I was youthful, very enthusiastic, impetuous, and not too discreet. What I did was to set up a program to prove that the conclusions of the fully-acknowledged head of plant breeding, Dr. (H. J.) Webber, were false, possibly, in determining which of two strains of corn was the better.

The basis on which I challenged his conclusion was that he had not taken into his analysis sufficient consideration of the item of when rainfall had come relative to the maturing of the crop of the two different strains of corn that he was testing. I looked up data as to when events had happened in the lives of those two crops, made lanternslides, and then without any experimental verification advanced the theory that this rain had come opportunely for one and not opportunely for another, that his conclusions were not justified.

I don't remember exactly what happened. I do remember, however, that there were a good many people present at the seminar, and later I watched the reports of plant breeding to see if consideration had been given to that aspect of testing. As I remember, it had no effect. They had not begun to take into consideration the question of rainfall in relation to the crop development. However, in reading the program of an agriculture engineering meeting this year, I was interested to

see that one of the papers was devoted to the question of the effect of the timing of irrigation on the performance of various crops. Apparently now, somebody is taking that aspect of the relation of weather to the cycle of the crop growth into definite consideration. But Dr. Webber didn't seem to be impressed at the time, when a young whippersnapper from Sibley was challenging his findings.

One other item that I had noted here was that, in the early days of our teaching, Professor Whetzel, who lived in Forest Home, had the problem of domestic sewage disposal in connection with his residence in Forest Home. I used to have photographs of the septic tank which we built for Professor Whetzel with the work of some of our advanced students. The thing that has interested me very much is that the septic tank which we built for him was really a very advanced type. It consisted of a preliminary chamber for decomposition and also a dosing chamber subsequent to the decomposition. In the bottom of the dosing chamber we installed a Pacific Flushing Tank Co. siphon, the function of which was to permit the effluence from the septic tank to accumulate to a predetermined depth in the dosing chamber and then the siphon would function to permit the entire contents of the dosing chamber to discharge vigorously through the outlet pipe and then stop. Then there would be no dosing until the chamber filled up again. The net result of that, was to permit intermittency of application of septic tank effluent, and so allow aeration of the area of the disposal tile. The area for disposal was very, very limited. It was just a bank of the drive right by the present foot bridge over Fall Creek. So far as I know, there has never arisen public objection to that disposal system. All it consisted of, I think, was one row of tile set in the bank on the side of the road, and I gather that they dig it up every year and find that at the end of the tile there is always an accumulation of black humus, but because it is intermittent it has never become offensive. Now, I think, Forest Home has a regular drainage system, but Professor Goodman took care of the sewage problem of his house by building a second, very large seepage cesspool. But the application of sewage to that seepage cesspool is not intermittent.

Back in those days, I had another interesting experience. At Farmers' Week, I gave talks on sewage disposal, and one winter there came to me after those talks an old gentleman named Van Deuser and who lived in Horseheads. He had a creamery chain and down at Laceyville on the Susquehanna he had a branch creamery. He came to me and said that he wanted me to design a septic tank to take care of the sewage from his creamery at Laceyville. I told him that in the first place, creamery sewage was very difficult to handle biologically, and also that a septic tank is only part of the process, that completion of disposal necessitated the functioning of aerobic bacteria. I told him that at Laceyville he didn't have an adequate area for the aeration and I was sure that he would get into trouble. But the old gentleman was persistent, and I wasn't old enough to be sufficiently resistant so on the basis of his insistence, I designed a septic tank for him. It had in it a Pacific flush tank siphon such as I'd installed for Whetzel, only of a different size. It was bigger. I well remember that when the first functioning of the dosing chamber was to occur, I looked on nervously, observing the rising of the water in the dosing chamber. It came to the pre-determined level and the siphon didn't begin to function. It got higher and higher, and people who were

looking on said, "Oh, isn't that too bad. He's such a nice young man." Presently it functioned, and discharged. Then the next accumulation in the dosing chamber occurred and it discharged at the pre-determined level. Then I discovered that what had happened in the first place was that the internal condition of the water level within the dosing siphon mechanism was different in the initial occurrence than it was after the thing had shot itself through according to the routine. Well, not to draw this story out too long, Van Deuser ran the sewage through the septic tank of the Laceyville creamery and the siphon duly discharged into all the aerobic piping that he had been able to install, according to my instructions, in the area available. Just as I had told him, that area was inadequate and as he continued to discharge creamery septic effluent into inadequate aerobic piping, the aerobic system was overloaded. It couldn't handle the organic material that was shot into it, and the whole aerobic area became a stinking mess. On a nice, damp evening in Laceyville the inhabitants were stunk out of their homes. So Van Deuser had to short-circuit his outfit and discharge into the Susquehanna River the way he always had before. But that was an interesting experience.

The following is the third interview with Professor Riley, held on August 28, 1963. The interviewer is Dr. Gould P. Colman.

Colman: I think that today we were going to talk about your experiences in resident instruction.

Riley: Yes, but let me finish one aspect of the work that I would like to speak about before we start the other. That was the trip, which I think I have mentioned before but which I would like to talk a little more about. That was the trip in which I had two student assistants and a Dodge truck, and I went around also in my own automobile. The boys and Mrs. Riley went with me. I just wanted to mention the names of people associated with that. The two boys who ran the truck and did the work were (Robert E.) Britt and (Landis) True.

Bob Britt is now living near Washington D. C., and Landis True is, I think, employed at a bank up in Rochester. They were two fine fellows. I don't hear from Landis, but I do hear every year from Bob Britt. I would like to speak particularly of one demonstration of this water supply equipment that was in a rather backcountry county. As I remember it, the home demonstration agent who functioned there was Miss (Marian) Barths. I think she has been spoken of quite often because of her very fine record of work with the country women. That meeting was particular with Mrs. Riley and me because there was present at the meeting a farm woman in work clothes, and we found that she was very fearful that her husband would find that she was attending that meeting because she had run away from hoeing corn in their cornfield. She had just come over to our demonstration to hear it. As I say, she was fearful that her husband would find that she had run away from work, so that is an indication of the level of rural civilization in some of the areas of New York at that time.

Colman: Do you recall any of the audiences' reactions to these demonstrations?

Riley: Yes. These demonstrations were so directly applicable to their own

domestic needs that the reaction was always favorable. Another line of activity that we took part in was introducing farmers to radio. I had an assistant named (James) Francis, who has since passed on, but Jim would precede me for a demonstration, and we would hold the demonstrations at a church usually. Jim would get a ladder and climb up on the steeple and put up an antenna. Then I would go in and talk, and tell the people about the marvels of radio waves. They would sit from eight in the evening until ten, until they could get a few squawks from the time record at Arlington. Once in a while we'd get KDKA from Pittsburgh. I was a true prophet when I told them that they should not buy immediately, that there were going to be great changes. But the way they would sit and wait was very stimulating.

Colman: Did the women form a large part of your audiences?

Riley: Yes, at the water supply demonstrations, but at the radio meetings there were a great many men. I didn't have too many of those. We went to Danby and up towards Geneva.

You asked about my resident instruction. That was the impelling motive of my going to Bailey in the first place, and it's what kept me going through the years. I always liked to explain how things worked, and also I had found during my few months of teaching in Sibley College, where I had been instructing in mechanical laboratory to seniors in electrical engineering, that as I talked with them about the experiments that they were to do, they were very lacking even after three years of technical instruction in any tangible concept of the significance of the facts that they had been getting out of textbooks. I was impressed with the fact that their reasoning ability had not been well developed. So after Professor Bailey gave me a chance to teach to farmers, to men who very much needed to use the ability to reason and to apply the simple aspects of mechanics that were so vitally necessary for them to employ in the activities on the farm as they existed at that time, the desire on my part, to get these farm boys instructed so that they knew the simple elements of mechanics so that they could determine by their own reasoning how to apply them impelled me all through my teaching years.

Colman: How large were these early classes?

Riley: As I remember, about one hundred to one hundred and fifty. The work was so obviously useful that it was welcomed by all the faculty advisers on the staff, and practically everybody was advised to take these courses because they were just horse sense. I endeavored always to present situations and then ask questions that would start reasoning reactions. Then I would finish up by making the solution rationally clear.

Colman: Did you find many farm boys who didn't know how to adjust a plow?

Riley: As a matter of fact, I didn't take them out to plowing. Later on, Jennings took on implements as such.

Colman: Could you tell me something about the winter course students?

Riley: You ask about the winter course students. You see, when I began, there was just no established procedure and no equipment. I began writing materials

long-hand and copying letters with a wet cloth and a letter press and teaching the few students that we had in the beginning the sort of thing that I had been teaching in Sibley. There was need for a course in surveying, so I set to work to get some surveying instruments and to give such a course. Then at that time, the winter course was very popular and I gave a version of farm mechanics for the winter course students. Also I remember that I had a course in farm structures, in which farmers and their wives came, and we studied house planning and bathroom construction and plumbing and that sort of thing. Later on when Robb was fully established, he took over the surveying and later Goodman took over the work in structures, Jennings took over the work in farm machinery. (N.B. See later accounts of Robb's course.)

Colman: Was this a winter course that the farmers and their wives attended?

Riley: Yes. There were a lot of women in the winter course. I remember that we had very lively seminars on house planning and that sort of thing.

Colman: How long would these courses last?

Riley: There would be about two lectures a week and one laboratory for each student. It was required that two or three days be assigned to laboratories. When I was handling everything, I was pretty busy.

Colman: You once told me about a party that you had in agricultural engineering upon the occasion of your retirement. Could you describe that at greater length?

Riley: Mrs. Riley and I always strove to promote unity and cordiality in the department. There are three occasions that come to my mind. One was a department picnic that we held at our farm on the Bundy Road soon after we had moved onto the farm in 1913. The next one was a party that we held in a seminar room. I think it must have been in Warren Hall. For that party, I made some wooden numerals from one to fifteen that served to designate the different tables at which people were to eat. I worked out a schedule by which we had periodic changes as the evening progressed. I had it worked out so that nobody sat at the same table with his previous companions except one couple that came twice to the table at which Mrs. Riley and I sat. Working that out mathematically was rather interesting.

Probably the most important departmental party that we had was one engineered by my wife, who was very much interested in patriotic history. She had a very ambitious plan to have a party for the entire department and their friends to set the atmosphere of colonial days. To make this vivid, she prepared a program on which there was an outline diagram of the thirteen original colonies. This was mimeographed, and adjacent to the appropriate colony was printed the food that was characteristic of that part of the United States in the colonial days. Thus for New England, there was baked beans, brown bread, and pickles. For Massachusetts there was codfish. For New Jersey there was cole slaw and cinnamon buns; for Delaware, sweet potatoes; and further south there was ham, hominy, and corn bread. We provided this food in generous supply, but what was to have been the major feature of the party was that my wife had hoped to have a fully worked-out program by which the party would seem

to be contemporaneous with the process of adopting the Constitution of the United States. Her plan was to have one of the boys of the department dressed in colonial costume come periodically to the meeting and carry reports of the progress of the framing of the Constitution. As part of that, my son came down from Rochester with fancy dress of the colonial period, and he brought for me a costume for Uncle Sam. But the date came a little too soon, and that part of the program was not adequately carried out. There were a lot of people, and there was an awful lot of good food. It made quite a finale for my forty years of teaching in the department.

Colman: You once told me that you visited Professor [Isaac P.] Roberts several years before his death. I wonder if you could describe that and what he looked like.

Riley: The occasion on which I met Professor Roberts was, when on sabbatical leave in 1926 my son and I were on a trip around the country. I had come up from El Paso and San Diego to Palo Alto, where I had visited Professor Harris J. Ryan to talk with him about lightning rods. I then learned from the Ryans that Professor Roberts was living near them. It was arranged that I should meet him. As I remember, that meeting took place in an automobile garage. The old gentleman came in, erect as ever, very civil in his manner. His appearance was that of a homespun farmer. He certainly did not have the appearance of an academic scholar. I may be wrong in this, but I think it was through his son that the contact was made. I do not think that there was any epoch-making conversation. It was simply that we exchanged polite greetings. I told a little of conditions in Ithaca at the time, and he somewhat about the early days of the College of Agriculture. But further than that my memory does not extend.

There has been mention made of conditions in the College of Agriculture at the time that Mr. (B. T.) Galloway was dean. I remember that quite vividly although his impact on ag. college tradition did not affect me as much as it did the older faculty members, who were primarily interested in agriculture. Mr. Galloway's right-hand man was Mr. (H. E.) Allanson, and he was a veritable major domo. Practically all routine contacts with the dean, as I remember, had to be made through Mr. Allanson. He was a man, I should say, of thirty or thirty-five years old, very suave, and very efficient. Administration was very effective under him. Since I was really an outsider in the agricultural faculty, the changes that Mr. Galloway imposed did not offend me to the extent that it did the older faculty members who were very intent in determining agricultural college policy. When Dean Mann came in, he had worked so closely with Dean Bailey and was so fully conversant with all of the traditions of the College of Agriculture and with Cornell University as well, that there was a very distinct change of administrative atmosphere.

One incident that shows my youthful enthusiasm, as I recall, was that with some policy of Dean Bailey's, I was not in sympathy. And since "fools rush in where angels fear to tread," I went to Dean Bailey and told him that I didn't agree with him and said that I would like to object to his plan in the faculty meeting. He, being completely serene in his realization of his supreme control of the situation, kindly agreed to my plan. At the faculty meeting, I did get up and oppose his proposal. I remember Professor (J. H.) Comstock's reaction to that.

When he was disturbed, Professor Comstock stuttered a little, as I remember. He said, "This is the most rrrrremarkable performance that I have ever listened to." Then Dean Bailey interposed to say that I had come to him in advance and that he had agreed to my remarks that I just made. As I remember, what I had to say had no influence on what happened.

Under Dean Bailey's leadership, his consecration of purpose, and his individual capacities, he so completely dominated the situation that there was no sense of controversy. We all agreed with his objectives and he was [in] such complete control of the situation that there was no thought that anything but his point of view should prevail. I was so much of an outsider that I did not become familiar with the political aspects of his relation to the university as a whole. That caused a good deal of a disturbance in the thinking of other faculty members as I remember.

Colman: What were your impressions of (George) Warren?

Riley: Professor Warren? A very practical thinker, very energetic. He approved of my buying a farm and operating it. He said it would keep my feet on the ground, which was the philosophy that he applied to himself. He was continually operating his own extensive farming enterprise and applying to it his own philosophies.

You asked my impression of him. It was that he was a very simple, straightforward, kindly man.

Colman: Would you like to describe your activities in advising Christian Science students at Cornell over the years?

Riley: My relation to the Christian Science organization at Cornell has been, to my mind, the most important activity that I had any part in. Our family lost two of three children, and it was after the passing of the second child that Christian Science was brought to my attention and I became fully convinced that if we had known of Christian Science and had resorted to it, we would have lost neither one of these children. It was about 1925 that I first began reading the Christian Science textbook, and in 1928 I formally joined with the Christian Science church. Just as soon as I was elected to The Mother Church, the students in Barnes Hall asked me to be faculty adviser. The adviser ahead of me had been Professor E. O. Fippin of the Department of Soils. That was in 1928.

In the fall of 1932, after an afternoon meeting of the Christian Science Society as it was then called, one of the young woman students seemed so very homesick that I invited her to come to our house for supper. Her enthusiastic acceptance of that invitation made me realize how much a faculty member could do to help students in their life problems. As a result of that contact, my wife and I gradually developed a system of Sunday evening meetings that continued for twenty years. I have always felt that they were ideal in the way they worked out. In their full career, this was what would happen at our house on Sundays. Early Sunday morning, my wife would begin the cooking of corn meal mush, and she would keep it going all day. Along at the end of the afternoon, we would start a six-quart kettle of cocoa, and about half past five, students would begin coming in. They would come in informally, go into the dining room, stretch out the dining table, put in all of the leaves that we had, and then set the table.

Others would go into the kitchen and begin preparing raw carrots and that sort of thing. Then at six o'clock, we would form in the hallway and march through into the kitchen and there pick up food, go into the dining room, and have an informal period of getting acquainted over the process of eating. Then when that was done, the dishes would be stacked in the kitchen and we would go into the library before an open fire. There I would read Christian Science metaphysical articles, several of them.

After that, we would adjourn to the front room on the other side of the hall and sing hymns out of the ample supply of Christian Science hymnals. This would continue until nine o'clock and then everybody would go home. At several of these meetings, there were present Christian Science lecturers who would give the young people very delightful remarks about their experiences of these same students. Many have kept up a contact with our family for many years.

As I progress in the study of Christian Science, I realize that the academic atmosphere of Cornell University as regards human biology is in a very elementary condition compared with the metaphysical truth that is set forth in the Christian Science interpretations of the teachings of the New Testament. It will be a good many years before existing academic and ecclesiastical traditional thinking yields completely to the metaphysical truth revealed by the Christian Science interpretations of the teachings of Christ Jesus as given in the New Testament.

It is interesting to note that the year 1866 marking the beginnings of Cornell University also marks the discovery of the science of the biology of the human body as it was demonstrated but not explained by Christ Jesus. That these discovered interpretations of the principles of this science were correct was proved by their discoverer, Mary Baker Eddy, by the many physical healings which she brought about by their application in actual practice over several years. Then, with the correctness of her teaching proven, in 1875 she published her findings in a book, *Science and Health, with Key to the Scriptures*, which she wrote, would bring physical healing to those who understandingly applied its teachings as she had done. The book was met with much disbelief, scorn and opposition, many declarations that it could not be understood, that its predictions would not be fulfilled, that no one would read it, and finally, that as a publishing enterprise it would be a complete failure.

The actual history of this book is set forth under date of 1950 by its publisher, William Dana Orcutt of the University Press of Cambridge, Massachusetts, and the Plimpton Press of Norwood, Massachusetts. In his book *Mary Baker Eddy and her Books*, as follows: "The world acclaims great authors, but Mrs. Eddy's *Science and Health* achieved the distinction of outlasting any book ever written by any single author in the history of the world—a book which today, forty years later after the passing of its writer, without a single alteration in the text since that day, is in greater demand than at any time during its seventy-five years of existence. To this it should be added that the year 1963 more copies of *Science and Health* were sold than in any previous year.

It is on the basis of the above record that I confidently predict that the enlarged department of biology which is proposed for Cornell University will,

ultimately and inevitably, find itself compelled to conclude that the laws on control of the biological functioning of the human body are to be found in the expoundings of the teachings of Christ Jesus as set forth in *Science and Health* by Ms. Eddy.



At the entrance to Riley-Robb Hall are the first three department heads who led the department for 64 years: Orval C. French, Byron B. Robb and Howard W. Riley. (Photograph was made in 1959.)

